

## Word Problem Answers

### p. 23

68. 7 t-shirts

69. 3 hours

70. \$500,000

71. 9 hours

72.  $15c + 22(10 - c) = 199$ ; 3 CDs and 7 DVDs; you would be able to buy 5 CDs & 5 DVD

### p. 33

4.  $1.8b + c = 45$ ; since you want equal amounts of each, use the same variable

$$1.8x + x = 45; x \text{ approx } 16$$

5. 4.8 hours

10. 13.2 cm

### p. 38-39

24. 156.25 mi/h

25. 3.75 km/hr

26. 5.5 min

29.  $3x + 18 = 72$ ; 18 in, 24 in, 30 in

31.  $40x + 7(20 - x) = 404$ ; 8 boxes books, 12 boxes clothes

### p. 57

74.  $|h - 110.25| \leq 0.4$

75.  $|p - 6.5| \leq 1$

76. a.  $|p - 0.85| \leq 0.05$

b.  $0.8 \leq p \leq 0.9$

c. about 15.2%, 18%

77.  $|b - 21| > 1$

### p. 59

1. a.  $60g + 51(12 - g) = 675$

b. city: 7 gallons; highway: 5 gallons

c. city: 420 miles; highway: 255 miles

2. a.  $|p - 3.5| \leq 0.25$

b.  $3.25 \leq p \leq 3.75$

8. 26 field goals

**Extra Example 1.2**

Simplify the expression

$$-3(5 - x) + 6(2x + 4); 15x + 9$$

**Extra Example 1.3**

Solve  $8(3x - 4) = -5(6 - 3x)$ .  $\frac{2}{9}$

**EXAMPLES****3 and 4**on pp. 11–12  
for Exs. 10–16**1.2****Evaluate and Simplify Algebraic Expressions**

pp. 10–

**EXAMPLE**

Simplify the expression.

$$5(y - 4) - 3(2y - 9) = 5y - 20 - 6y + 27$$

Distributive property

$$= (5y - 6y) + (-20 + 27)$$

Group like terms.

$$= -y + 7$$

Combine like terms.

**EXERCISES**

Simplify the expression.

10.  $25x + 14 - 17 - 6x$   $19x - 3$

11.  $6y + 12x - 12y - 9x$   $3x - 6y$

12.  $6(n - 2) - 8n + 40$   $-2n + 28$

13.  $5(2b + 3) + 8(b - 6)$   $18b - 33$

14.  $3g + 9g^2 - 12g^2 + g$   $-3g^2 + 4g$

15.  $7t^4 + 7t^2 - 2t^2 - 9t^4$   $-2t^4 + 5t^2$

16. **TAXI RATES** A New York City taxi charges \$2.50, plus \$.40 for each fifth of a mile if it is not delayed by traffic. Write an expression for the cost of the ride if you travel  $x$  miles in the taxi with no traffic delays.  $2x + 2.5$

**1.3****Solve Linear Equations**

pp. 18–

**EXAMPLE**

Solve  $-4(3x + 5) = -2(5 - x)$ .

$$-4(3x + 5) = -2(5 - x)$$

Write original equation.

$$-12x - 20 = -10 + 2x$$

Distributive property

$$-20 = -10 + 14x$$

Add  $12x$  to each side.

$$-10 = 14x$$

Add  $10$  to each side.

$$-\frac{5}{7} = x$$

Divide each side by  $14$  and simplify.**EXERCISES**

Solve the equation. Check your solution.

17.  $24x + 16 = 12$   $-\frac{1}{6}$

18.  $-6y + 15 = -9$   $4$

19.  $4(q - 5) = 16$   $9$

20.  $7m + 38 = -5m - 16$   $-4.5$

21.  $48j + 25 = 12j - 11$   $-1$

22.  $8(2n - 5) = 3(6n - 2)$   $-17$

23. **SALES TAX** You buy a jacket, and the sales tax is 6%. The total cost is \$79.49. Find the cost of the jacket before the tax. **\$74.99**

24. **FOOD SHOPPING** At a vegetable stand, you bought 3 pounds of peppers for \$4.50. Green peppers cost \$1 per pound and orange peppers cost \$4 per pound. Find how many pounds of each kind of pepper you bought.  
**2.5 lb green peppers, 0.5 lb orange peppers**

**EXAMPLES****1, 2, 3, and 4**on pp. 18–20  
for Exs. 17–24

## 1.4 Rewrite Formulas and Equations

pp. 26–32

15.  $y = -10x + 1$   
 $-23$

16.  $y = \frac{3}{8}x + \frac{9}{4}$ ; 3

17.  $y = \frac{-15}{x-6}$ ; 15

18.  $y = \frac{2}{3}x - \frac{3}{2}$   
 $\frac{1}{2}$

19.  $y = \frac{5}{2}x - 5$   
 $-20$

20.  $y = \frac{x-1}{3x}$ ;  $\frac{2}{5}$

**EXAMPLES**  
2, 3, and 4  
on pp. 27–28  
for Exs. 25–31

### EXAMPLE

Solve  $5x - 11y = 7$  for  $y$ . Then find the value of  $y$  when  $x = 4$ .

**STEP 1**  $5x - 11y = 7$

Write original equation.

$-11y = 7 - 5x$

Subtract  $5x$  from each side.

$y = -\frac{7}{11} + \frac{5}{11}x$

Divide each side by  $-11$ .

**STEP 2**  $y = -\frac{7}{11} + \frac{5}{11}(4)$

Substitute 4 for  $x$ .

$y = \frac{13}{11}$

Simplify.

### EXERCISES

25–30.

Solve the equation for  $y$ . Then find the value of  $y$  for the given value of  $x$ . See margin.

25.  $10x + y = 7$ ;  $x = 3$

26.  $8y - 3x = 18$ ;  $x = 2$

27.  $xy - 6y = -15$ ;  $x = 5$

28.  $4x = 6y + 9$ ;  $x = 9$

29.  $5x - 2y = 10$ ;  $x = -6$

30.  $x - 3xy = 1$ ;  $x = -5$

31. **GEOMETRY** The formula  $S = 2\pi rh + 2\pi r^2$  gives the surface area  $S$  of a cylinder with height  $h$  and radius  $r$ . Solve the formula for  $h$ . Find  $h$  if  $r = 5$  centimeters and  $S = 400$  square centimeters.  $h = \frac{S - 2\pi r^2}{2\pi r}$ ; about 7.73 cm

### Extra Example 1.4

Solve  $4x - 3y = 9$  for  $y$ . Then find the value of  $y$  when  $x = 15$ .

$y = -3 + \frac{4}{3}x$  or  $y = \frac{4}{3}x - 3$ ; 17

### Extra Example 1.5

If you drive 264 miles in 5.5 hours, what is your average speed?  
48 mi/h

## 1.5 Use Problem Solving Strategies and Models

pp. 34–40

### EXAMPLE

Find the time it takes to drive 525 miles at 50 miles per hour.

Distance (miles)	=	Rate (miles/hour)	•	Time (hours)
↓		↓		↓
525	=	50	•	$t$

$525 = 50t$  Write equation.

$10.5 = t$  Divide each side by 50.

► It takes 10.5 hours to drive 525 miles at 50 miles per hour.

### EXERCISES

32. **AVERAGE SPEED** It takes 3 hours for a train to travel 175 miles. What is the average speed of the train?  $58\frac{1}{3}$  mi/h
33. **CAR RENTAL** While on vacation, your family rented a car for \$293. The car rental cost \$180, plus \$.25 for every mile driven over 150 miles. How many miles did you drive while on vacation? 602 mi

**EXAMPLES**  
1 and 4  
on pp. 34–36  
for Exs. 32–33

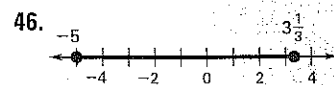
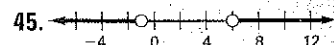
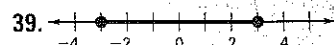
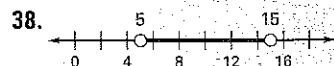
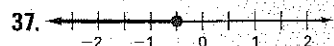
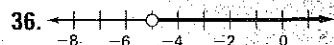
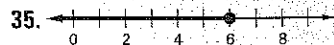
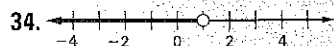
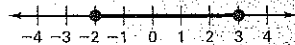
## Extra Example 1.6

Solve  $18 + 2x > 5x + 6$ . Then graph the solution.  $x < 4$



## Extra Example 1.7

Solve  $|4x - 2| \leq 10$ . Then graph the solution.  $-2 \leq x \leq 3$



## 1.6 Solve Linear Inequalities

pp. 41-47

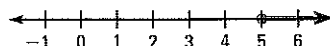
### EXAMPLE

Solve  $25 - 3x \leq 10$ . Then graph the solution.

$$25 - 3x \leq 10$$

$$-3x \leq -15$$

$$x \geq 5$$



Write original inequality.

Subtract 25 from each side.

Divide each side by  $-3$  and reverse the inequality.

Graph the solution.

### EXERCISES

Solve the inequality. Then graph the solution. 34-39. See margin for art.

34.  $2x - 3 < -1$   $x < 1$

35.  $7 - 3x \geq -11$   $x \leq 6$

36.  $15x + 8 > 9x - 22$   $x > -5$

37.  $13x + 24 \leq 16 - 3x$   $x \leq -\frac{1}{2}$

38.  $-5 < 10 - x < 5$   $5 < x < 15$

39.  $-8 \leq 3x + 1 \leq 10$   $-3 \leq x \leq 3$

40. **GEOMETRY** A triangle has sides of lengths 10,  $2x$ , and  $3x$ . The sum of the lengths of any two sides is greater than the length of the third side. Write and solve three inequalities to find the possible values of  $x$ .  
 $10 + 2x > 3x$ ,  $5x > 10$ ,  $10 + 3x > 2x$ ;  $x < 10$ ,  $x > 2$ ,  $x > -10$ ;  $2 < x < 10$

## 1.7 Solve Absolute Value Equations and Inequalities

pp. 51-58

### EXAMPLE

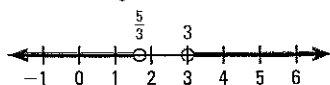
Solve  $|3x - 7| > 2$ . Then graph the solution.

$$|3x - 7| > 2$$

$$3x - 7 < -2 \quad \text{or} \quad 3x - 7 > 2$$

$$3x < 5 \quad \text{or} \quad 3x > 9$$

$$x < \frac{5}{3} \quad \text{or} \quad x > 3$$



Write original inequality.

Write equivalent compound inequality.

Add 7 to each side.

Divide each side by 3.

Graph the solution.

### EXERCISES

Solve the equation. Check for extraneous solutions.

41.  $|3p + 2| = 7$   $-3, 1\frac{2}{3}$

42.  $|9q - 5| = 2q$   $\frac{5}{7}, \frac{5}{11}$

43.  $|8r + 1| = 3r$  no

Solve the inequality. Then graph the solution. 44-46. See margin for art.

44.  $|x - 5| \geq 1$   $x \leq 4$  or  $x \geq 6$

45.  $|5 - 2y| > 7$   $y < -1$  or  $y > 6$

46.  $|6z + 5| \leq 25$   $-5 \leq z \leq 4$

47. **VOLLEYBALL** The circumference of a volleyball should be 26 inches, with a tolerance of 0.5 inch. Write and solve an absolute value inequality that describes the acceptable circumferences of a volleyball.  $|v - 26| \leq 0.5$ ,  $25.5 \text{ in.} \leq v \leq 26.5 \text{ in.}$

### EXAMPLES

2, 3, 4, and 5

on pp. 52-54

for Exs. 41-47

# CHAPTER TEST

Graph the numbers on a number line. 1, 2. See margin.

1.  $-2, -\frac{7}{4}, 6.5, \sqrt{30}, \frac{1}{3}$

2.  $\frac{9}{2}, 0.8, -5.5, -\sqrt{10}, -\frac{3}{4}$

Use properties and definitions of operations to show that the statement is true. Justify each step. 3, 4. See margin.

3.  $5 + (x - 5) = x$

4.  $(3d + 7) - d + 5 = 2d + 12$

Evaluate the expression for the given values of  $x$  and  $y$ .

5.  $4x - 6y$  when  $x = 5$  and  $y = -3$  38

6.  $3x^2 - 9y$  when  $x = 2$  and  $y = 4$  -24

Simplify the expression.

7.  $5n + 10 - 8n + 6$   $-3n + 16$

8.  $10m - 4(3m + 7) + 6m$   $4m - 28$

9.  $11 + q - 3q^2 + 18q^2 - 2$   $15q^2 + q + 9$

10.  $9t^2 + 14 - 17t + 6t - 8t^2$   $t^2 - 11t + 14$

11.  $5(x - 3y) + 2(4y - x)$   $3x - 7y$

12.  $5(2u + 3w) - 2(5u - 7w)$   $29w$

Solve the equation. Check your solution.

13.  $5n + 11 = -9$  -4

14.  $6k + 7 = 4 + 12k$  0.5

15.  $-t - 2 = 9(t - 8)$  7

Solve the equation for  $y$ . Then find the value of  $y$  for the given value of  $x$ .

16.  $12x - 28y = 40$ ;  $x = 6$

17.  $x + 4y = 12$ ;  $x = 2$

18.  $15y + 2xy = -30$ ;  $x = 5$

16.  $y = \frac{3}{7}x - \frac{10}{7}$

17.  $y = -\frac{1}{4}x + 3$

18.  $y = \frac{-30}{15 + 2x}$

Solve the inequality. Then graph the solution. 19–21. See margin for art.

19.  $-5x - 6 < 19$   $x > -5$

20.  $x + 22 \geq -3x - 10$   $x \geq -8$

21.  $5 < 2x + 3 \leq 11$   $1 < x \leq 4$

Solve the equation. Check for extraneous solutions.

22.  $|3d - 4| = 14$   $-3\frac{1}{3}, 6$

23.  $|f + 3| = 2f + 4$  -1

24.  $|10 - 7g| = 2g$   $1\frac{1}{9}, 2$

Solve the inequality. Then graph the solution. 25–27. See margin for art.

25.  $|x - 5| \leq 30$   $-25 \leq x \leq 35$

26.  $|3y + 4| > 2$   $y < -2$  or  $y > -\frac{2}{3}$

27.  $|\frac{2}{3}z - 5| < 5$   $0 < z < 15$

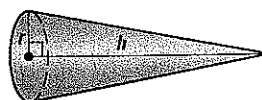
28. **WIRELESS NETWORK** To set up a wireless network for Internet access at home, you buy a network router for \$75. The fee for DSL service is \$18 per month. Write an expression for the amount of money you spend in  $n$  months. How much money do you spend in 12 months?  $18n + 75$ ; \$291

29. **CAR REPAIR** The bill for the repair of a car was \$420. The cost of parts was \$240. The cost of labor was \$45 per hour. How many hours did the repair take? 4 h

30. **HOUSEHOLD CHORES** You can wash one window in 15 minutes and your sister can wash one window in 20 minutes. How many minutes will it take to wash 12 windows if you work together? about 103 min

31.  $h = \frac{3V}{\pi r^2}$   
about 10.7 in.

31. **GEOMETRY** The formula  $V = \frac{1}{3}\pi r^2 h$  gives the volume  $V$  of a cone with height  $h$  and base radius  $r$ . Solve the formula for  $h$ . Then find  $h$  when  $r = 2$  inches and  $V = 45$  cubic inches.



## Additional Resources

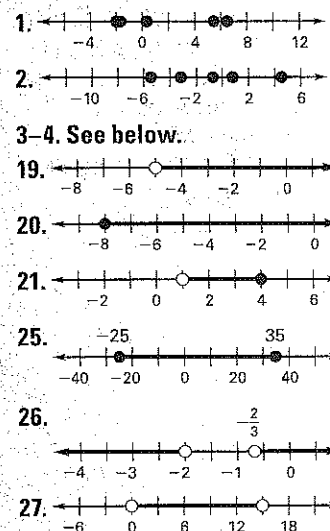
### Assessment Book

- Chapter Test, Levels A, B, C, pp. 4–9
- Standardized Chapter Test, pp. 10–11
- SAT/ACT Chapter Test, pp. 12–13
- Alternative Assessment, pp. 14–15

### Test Generator CD-ROM

### Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 1E–1F.



3.  $5 + (x - 5) = 5 + (x + (-5))$  Def. of subtraction  
 $= 5 + ((-5) + x)$  Comm. prop. of addition  
 $= (5 + (-5)) + x$  Assoc. prop. of addition  
 $= 0 + x$  Inverse prop. of addition  
 $= x$  Identity prop. of addition

4.  $(3d + 7) - d + 5 = (3d + 7) + (-d) + 5$  Def. of subtraction  
 $= 3d + (7 + (-d)) + 5$  Assoc. prop. of addition  
 $= 3d + ((-d) + 7) + 5$  Comm. prop. of addition  
 $= (3d + (-d)) + (7 + 5)$  Assoc. prop. of addition  
 $= 2d + 12$  Combine like terms.

# Extra Practice

## Chapter 1

### 1.1 Graph the numbers on a number line. 1-3. See margin.

1.  $-2, \frac{5}{3}, 0.2, -\sqrt{2}, -\frac{5}{4}$

2.  $-\frac{4}{3}, 1, -1.2, \sqrt{3}, 1.9$

3.  $3.7, -\sqrt{7}, -\frac{1}{2}, 4, \sqrt{15}$

### 1.1 Perform the indicated conversion.

4. 18 feet to inches 216 in.

5. 20 ounces to pounds 1.25 lb

6. 3 years to hours 26,280 h

### 1.2 Evaluate the expression for the given value of the variable.

7.  $-2p + 5$  when  $p = -5$  15

8.  $3x^2 - x + 7$  when  $x = -1$  11

9.  $8z^3 - 6z$  when  $z = 2$  52

### 1.2 Simplify the expression.

10.  $2y^2 - 3y + 5y^2 - 7y^2 - 3y$

11.  $4r^2 - 5r + 2r^2 + 12$

12.  $-w^3 + w^2 - 7w^2 - 8w^3$

13.  $2(b + 5) + 3(2b - 10)$

14.  $-7(t^2 + 2) + 9(t - 2)$

15.  $4(m - 3) - 5(m^2 - m)$

### 1.3 Solve the equation. Check your solution.

16.  $3a + 2 = 11$  3

17.  $-9 = b - 14$  5

18.  $8 - 0.5c = 1$  14

19.  $-3n - 7 = -n + 17$  -12

20.  $12m = 15m - 7.5$  2.5

21.  $6p + 1 = 21 - 4p$  2

22.  $6(x + 1) = 2x - 10$  -4

23.  $4(y - 3) = 2(y + 8)$  14

24.  $11(z - 5) = 2(z + 6) - 13$

### 1.4 Solve the equation for y. Then find the value of y for the given value of x. 25-30. See margin.

25.  $6y - x = 18$ ;  $x = 2$

26.  $2x + 3y = 12$ ;  $x = -6$

27.  $4y - 9x = -30$ ;  $x = 6$

28.  $3x - xy = 20$ ;  $x = 8$

29.  $4y + 6xy = 10$ ;  $x = -2$

30.  $5x + 8y + 4xy = 0$ ;  $x = -1$

### 1.5 Look for a pattern in the table. Then write an equation that represents the table.

31.

x	0	1	2	3
y	25	22	19	16

$y = -3x + 25$

32.

x	0	1	2	3
y	1.5	4	6.5	9

$y = 2.5x + 1.5$

### 1.6 Solve the inequality. Then graph the solution. 33-41. See margin for art.

33.  $x + 2 > 9$   $x > 7$

34.  $-13 - 3x < 11$   $x > -8$

35.  $4x - 9 \leq 2x + 1$   $x \leq 5$

36.  $-3x - 8 \geq -9x + 10$   $x \geq 3$

37.  $-7 < x + 3 \leq 1$   $-10 < x \leq -2$

38.  $-4 \leq 3x - 7 \leq 4$   $1 \leq x \leq \frac{11}{3}$

39.  $-9 \leq 5 - 2x < 7$   $-1 < x \leq 7$

40.  $x + 3 < -2$  or  $x - 7 > 0$   
 $x < -5$  or  $x > 7$

41.  $2x + 9 \geq 3$  or  $-5x + 1 \leq 0$   
 $x \geq -3$

### 1.7 Solve the equation. Check for extraneous solutions.

42.  $|g + 5| = 4$  -9, -1

43.  $|\frac{1}{3}q - \frac{2}{3}| = 1$  -1, 5

44.  $|10 - 3t| = t + 4$  1.5, 7

### 1.7 Solve the inequality. Then graph the solution. 46-53. See margin for art.

46.  $|a| < 2$   $-2 < a < 2$

47.  $2c > 14$   
 $c < -7$  or  $c > 7$

48.  $|g + 11| \geq 2$   
 $g \leq -13$  or  $g \geq -9$

49.  $|4j - 7| \leq 9$   $-\frac{1}{2} \leq j \leq \frac{11}{2}$

50.  $|0.25m + 3| \geq 1$   
 $m \leq -16$  or  $m \geq -8$

51.  $|10 - 2p| > 9$   
 $p < \frac{1}{2}$  or  $p > 9.5$

52.  $|\frac{0.6r + 8}{3}| \leq 17$   
 $-\frac{125}{3} \leq r \leq 15$

53.  $|\frac{5t - 9}{8} + 9| < 10$   
 $\frac{8}{5} < t < 2$

1010 Student Resources

